Stellwagen Sanctuary Biodiversity: Seabirds

What is a Seabird?

A seabird is a bird that spends much of its life on the open ocean feeding mostly on marine organisms, coming ashore only to breed and occasionally rest. Amount of time spent on land varies per species of seabird; those species that spend little or no time resting on shore are referred to as pelagic birds. The word 'pelagic' is an adjective referring to the open ocean. While gulls, terns and other seabird species are commonly seen resting on the shoreline, pelagic species like the Wilson's Storm-Petrel usually won't rest on shore unless pushed there by events like storms.

The nostrils of this Northern Fulmar help excrete salt with the salt glands, an adaptive trait common in the Procellariiformes order. Credit: Steve Garvie.

Credit: Edgar Thissen

Credit: Jeremiah Trimble

The Northern Gannet exemplifies stereoscopic vision (above). Long wings and countershading are traits of the Cory's Shearwater (right).

Surviving at Sea: Adaptive Traits in Seabirds

Living on the open ocean brings with it challenges of traveling long distances, predation, foraging for food, exposure to weather and living in a salty medium. In order to survive in marine habitats, seabirds have evolved the following characteristics:

Long wings: Many seabirds found within Stellwagen Bank Sanctuary travel vast distances from their breeding colonies. For example, Sooty and Great shearwaters, frequent visitors to the Gulf of Maine (GoM), breed on south Atlantic and sub-Antarctic Islands. Having long wings allows seabirds to cover great distances with fewer, more powerful flaps of their wings, as well as soar. These abilities allow seabirds to cover long distances without tiring.

Countershading: Countershading is a type of camouflage where an individual's coloration is darker on top and lighter on the bottom. In marine animals, being darker on top allows the animal to blend into the ocean water, which provides protection against predation from above. Being lighter below allows an animal to blend into the lighter sky, allowing the animal to get closer to prey without being seen.

Stereoscopic vision: Some seabirds have their eyes closer together on their heads, similar to humans. This can be seen in Northern Gannets. Because gannets are such visual feeders, this adaptation seems to be linked with foraging efficiency. Stereoscopic, or binocular, vision allows a diving gannet to zero in on its prey (usually a singular fish) and keep the prey in focus as it transitions from a 30-plus foot dive to submersion and swimming beneath the surface.

Salt glands: In order to remain hydrated while living at sea, seabirds have evolved special glands that remove salt from seawater. Located above or within their eye sockets, the salt gland works much like the human kidney; a countercurrent blood flow removes excess salt from the bloodstream. Salt is excreted from the bird by either shaking its head or "sneezing" water from its nose.

Low reproductive rates and long maturation periods: Seabirds tend to have few offspring and individuals tend to experience multiple stages of growth before reaching a final adult form. Seabirds are able to invest more energy in offspring because they live in more stable environments than species like fish and krill, species regularly threatened by predators that suffer high natural mortality rates.

Threats to Seabirds

Seabirds are subject to and threatened by human use of their habitat. Some of these threats are direct: hunting of birds and harvesting of eggs, development of nesting areas, oil spills, entanglement in fishing nets and by-catch. Seabirds are also affected indirectly by overfishing, warming sea surface temperatures and competition between other birds due to lack of available resources. Whilst there are many human-induced threats to seabirds worldwide, there are also many organizations and networks monitoring seabird populations to understand the importance these organisms play within their marine environments and advocate for their protection.

Oil from the 2010 Deepwater Horizon oil spill coats the feathers of this Northern Gannet. Credit: Carol Forsloff.

Getting to Know the Seabirds of Stellwagen Bank Sanctuary

The sanctuary and its partners are working to better understand the role and importance of seabirds in the ecosystem through initiatives such as the Great Shearwater tagging project and the Stellwagen Bank Sanctuary Seabird Stewards Program (S4). Mass Audubon is the education partner for S4, and the program is supported largely by volunteers who collect data on the research vessel, *Auk*, and on whale watch boats. To find out more about this citizen science program or to become a volunteer, please contact Anne-Marie Runfola, Volunteer Program Coordinator, at anne-marie.runfola@noaa.gov or visit the Sanctuary's website: http://stellwagen.noaa.gov/.

Stellwagen Bank Sanctuary: An Important Bird Area

Mass Audubon has designated Stellwagen Bank an Important Bird Area (IBA). An IBA is a site that provides essential habitat to one or more species of breeding, wintering or migrating birds, and which supports high-priority species, large concentrations of birds, exceptional bird habitat, and/or has substantial research or educational value[1]. The Important Bird Areas Program was created by BirdLife International, of which Mass Audubon is an active partner, to aid in global bird habitat conservation.

53 seabird species have been documented within the sanctuary's boundaries to date. Of these, shearwaters, storm-petrels, gannets, phalaropes, gulls, terns, jaegers, alcids, and various sea duck species notably frequent the sanctuary. There is great diversity between these species; they vary in physical, feeding and migratory characteristics. For example, while the Northern Gannet can dive from a height of up to 130 feet and use its wings to swim under water and catch fish, other species like the Wilson's Storm Petrel draw plankton and krill to the surface by dipping their feet into the water. A complete list of seabirds documented within the sanctuary can be found in its 2010 Management Plan, Appendix J, available online: http://stellwagen.noaa.gov/management/fmp/fmp2010.html

[1] Massachusetts Important Bird Areas. Retrieved from http://www.massaudubon.org/Birds_and_Birding/IBAs/

More Information on Seabirds:

National Audubon Society: www.audubon.org
Cornell Lab of Ornithology: www.birds.cornell.edu
Massachusetts Audubon Society: www.massaudubon.org
Stellwagen Bank National Marine Sanctuary:
http://stellwagen.noaa.gov/visit/birdwatching/species.html
http://stellwagen.noaa.gov/science/shearwater13.html

S4 Whale Watch Research Cruise Partners:

7 Seas Whale Watch
Boston Harbor Cruises-New England Aquarium Whale Watch
Captain Bill & Son's Whale Watch
Captain John Boats Whale Watching and Fishing Tours
Dolphin Fleet of Provincetown
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